

Transformation of Artillery: Continuity and Change



A reduced-range practice rocket leaves the tube of a High-Mobility Artillery Rocket System (HIMARS) during 3rd Battalion, 27th Field Artillery (3-27 FA), 18th Fires Brigade (Airborne), training and qualifying at Fort Bragg, North Carolina. (Photo by GMG3 Jonathan Kammen, US Navy, Retired)

... and the lady seated next to Mr. Churchill said: "Mister Prime Minister, you are disgustingly drunk." And Winston Churchill replied, "Yes lady, you are right. I am drunk, and you are ugly. But tomorrow morning I will be sober."

When dealing with any transformation, some things change and some stay the same. Will it be done with wisdom to recognize what should not be changed and with the fortitude to deal with that which must change? This is the challenge facing the Artillery as it goes thru major transformation in the post-Cold War era. The purpose of this article is to address that challenge.

In this post-Cold War period, a radical change in the nature of the threat has claimed the attention of most free countries. Today, we are engaged in the War on Terrorism (WOT). The Army must be transformed to deal with emerging threats around the world while it is conducting WOT—not an easy job. Artillery transformation began from a

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posture with programs and structures designed for a very different enemy than we now face.


The Cold War threat was a massive, complex structure that outnumbered and outgunned allied forces. For the Artillery, it was particularly challenging with enemy artillery numerical advantages of five to one and sometimes as high as nine to one—that sets the starting point for Artillery transformation. Following are my thoughts on how this transformation is proceeding. To keep it simple and focused, I will give you "Three Ups and Three Downs;" the three things that are going well and must be sustained and the three things that are not going well and should be corrected.

Up Number One—Flatten Command and Control (C²). Flatten C²? As the proverbial saying goes, "When the captain said to flatten C² what did he mean?" "He

means that if someone in a fight in his area of operations (AO) needs something that is available within his AO, he ought to get what he needs when and where he needs it. That is what the Captain said." Wow, that is a big deal, and not easy; but, what a remarkable capability that would be.

The complicated C² system connecting the many different parts must be "flattened" as a set, to ensure operational and technical connectivity demanded. In Thomas Friedman's book, *The World Is Flat*, he points to the impact of the global Internet on business, where information is shuttled around the world at the speed-of-light for a variety of business transactions. If the multinational mercantile guilds can achieve interoperable global networks with unique currency and language systems, then one should expect some headway for joint and coalition commands.

The truth of the matter is that remarkable progress has been/is being made to flatten C² within a theater of operations. Just as the need to associate guns and targets on a "common grid," so that any



gun within range can be brought to bear, was recognized by the prescient General Leslie J. McNair before WWII; today, the Artillery has recognized its new challenge and again is leading the way. With the advent of Global Positioning System (GPS), networking and satellite communications, we can see the remarkable benefits of what is emerging as a “joint common grid”. General McNair would be pleased to see contemporary gunners expanding his original concept to that notion. Realization of the power of a “joint common grid” on a joint and Coalition battlefield is much more significant than any other development in the Army. Some of the work being done to flatten C² and achieve the joint common grid is highlighted below.

Joint Fires Instruction. At Fort Sill, Oklahoma, you find two new courses of instruction on the business of integrating joint Fires. One is the Joint Operational Fires and Effects Course (JOFEC) that covers the skills, techniques and procedures needed for effective planning and application of joint Fires. The second is the Joint Fires Observer (JFO) Course. Observers are trained to call in targets to a variety of fire assets.

This is the prompt institutional response to battlefield lessons learned that will be required to “flatten C².” It is also a giant step forward in integrating joint Fires and maneuver forces. In fact, JFO Course-qualified FOs and fire support NCOs now are deployed to Iraq and Afghanistan and putting their new skills to work every day.

Changes in Tactics, Techniques and Procedures (TTPs). Excellent progress is being made to flatten C² through revision to TTPs. Remarkable examples have come from combat experiences in Afghanistan and Iraq, and TTPs are being updated to capture them. TTPs are being updated to capture lessons from the field so that they can be taught in the schoolhouse, reflected in revisions to doctrinal publications and practiced at combat training centers.

Recent examples of such TTPs are from the Battle of Fallujah, where Task Force 2-2 Infantry Battalion Fire Support Element (FSE) operated as a mini-brigade FSE. The FSE coordinated the effects of Army, Air Force and Marine assets more autonomously than the traditional doctrinal battalion-level FSE—a model of joint interdependency and flattened C². Mortars of 2-2 Infantry were an integral part of indirect fires; danger-close missions were the rule with 155-mm

and 120-mm fires often within 200 meters of friendlies.

Organizations—Fires Battalions and Fires Brigades. Similarly, combat experiences are being reflected in the redesign of Army force structure with adaptive, modular units. Most significant are the brigade combat teams (BCTs) and Fires brigades. BCTs are the center piece of the ongoing modularity reformation. Within the BCT, the previous direct-support Artillery battalion has been made organic to a BCT as its Fires battalion. This preserves habitual association of the fire support team with maneuver counterparts, so critical to integrating fires effectively with maneuver. Additional sensors and communications were added to streamline the FA battalion’s responsiveness.

At echelons above the BCT, Fires brigades have been formed with the capabilities for providing fires at depth, and for close support. Fires brigades have organic necessary means, such as sensors and communications, to link the planners directly with the shooters.

Up Number Two—Concept of Fires. The concept for Fires is being updated. In its most basic form, battle is all about orchestration of maneuver forces and fires to close with and destroy the enemy. For fires to be effective, they must be integrated closely with maneuver forces at the required time and place—not an easy task.

Today’s battlefield construct is no longer an array of large combat formations. Rather, large areas are not occupied by contiguous forces, and battles may be occurring simultaneously in several different areas throughout an AO. There is little distinction between rear and deep battles. Targets appear any place within the AO. Today’s tempo is often greater.

Combat operations may be in one sector while stability operations are in another. Clearance of fires is more complex in contemporary operations. In today’s environment, we see an increasing number of time sensitive, high-payoff and point targets (some of them hard). Where fights do occur, it still remains a close-battle problem of fires and maneuver. To capture these changes, a new concept of fires has emerged.

Fires Concept—Close and Deep. Today’s battlefield yields two classes of fires: 1) close support fires and 2) fires at depth. Thinking of fires in these two forms simplifies the concept. The notion of counterfire could be either close or deep. In both classes of fire, considerations for unwanted collateral

effects are greater than before.

Thinking of fires as either outgoing or incoming further clarifies the challenge of integrating Air Defense Artillery (ADA) and Field Artillery (FA). At a recent seminar at Fort Sill, the Commandant of the Field Artillery School articulated his concept of fires and introduced the Virtual Center of Excellence for Fires. It is imperative to get the concept about fires right before tackling the sticky organizational issues. Establishing this integrated concept as a preamble to physically moving personnel and functions to collocate ADA and FA Schools is a smart idea.

The proposition to begin thinking of Fires as Fires, and not as ADA fires or FA fires, is the right move. Conceptually, they have the same focus. Fires are Fires; whether for close support, at depth or to deny incoming fires (from whatever source). The concept of Fires is all related to supporting the force commander and protecting the force.

Simplifying the Battlefield. Long range precision fires, immediately available 24/7, are an example of simplifying the battlefield. Planning, coordinating and executing long-range fires is a much simpler task than other alternatives for fires at depth. Coverage of several battles in various directions is not a challenge with the longer-range, precision weapons. Precision fires have proved invaluable in counterinsurgency operations where clearance of fires is particularly difficult. Long-range fires organic to formations are not limited by problems of weather, sortie generation, attrition rates, flying hours, on station time or mid-air refueling.

Counter-Rocket, -Artillery and -Mortars (C-RAM). Perhaps the best example of the new concept of fires is the work being done on the program known as: C-RAM. This initiative integrates Air Defense, sensor, communication, C², FA and intelligence functions into one package. It smoothly provides the ability to kill not only the incoming arrows, but the archer who shot them as well and to provide a warning to those who may be in an impact area.

C-RAM now is being fielded to combat AOs as the capability continues to be further refined and deployed. Following a traditional approach for developing this capability would have taken decades; but the forward thinking leaders driving this initiative are breaking new ground on the way to develop, acquire and field new combat capabilities. They are doing the smart, right thing.

Up Number Three—Integration of Fires and Maneuver. My third Up is the remarkable improvements in the integration of Fires and Maneuver.

Special Operating Forces (SOF). Sensitivity to specific examples precludes elaboration in this article; but, suffice it to say, there are field experiences of improving the integration of Fires, especially precision fires, with SOF that are very encouraging. One must be especially pleased with the use of long-range, precision fires and the capabilities of High-Mobility Artillery Rocket System (HIMARS) to support SOF. The mobility of HIMARS and the advantages of its long-range, precision munitions have been recognized and cleverly employed by SOF.

BCTs. The formation of the BCTs is a great step forward in integrating Fires and Maneuver. Transitioning the direct support battalions of Div Artys to organic Fires battalions of the BCT cements that

capability. Moreover, the integration of sensors and enhanced communications into the Fires battalion further streamlines the close-support fires organization and enhances integration.

Fire Support Elements (FSEs) and Fires Brigades. Reorganizing Artillery to deal with the new strategic environment has resulted in accepting the risk of eliminating Div Arty and corps Artillery organizations. The critical need to include planning, coordination and integration of Fires with maneuver at echelons above brigade has been enhanced with the colonel and brigadier positions for FSEs at division and corps. These are important measures to assure proper integration for Fires at depth.

Similarly, Fires brigades now being formed have, organic, the required sensor and communications means to streamline finding and executing time sensitive targets at depth. Personally, I think this may prove to be the smart decision in

the long run. This action in Artillery transformation powers-down and places greater responsibility on leaders at lower levels. Fortunately, equipment needed for C² of the new structures is being provided as well. Leaders in the field are demonstrating they have the capabilities to make this a good decision.

Down Number One—Leader Development is Unhinged. There is a critical problem associated with leader development. With the elimination of the divisional Artillery commands, the progressive assignment for successful FA battalion commanders is unhinged. Failure to provide progressive and sequential assignments adversely impacts leader development.

Analysis of Fiscal Year 2005 (FY05) Command Selections. The most recent command selections for FY05 illustrate the problem. From the data, one discerns significant differences in the opportunity for command of tactical units at the colonel level. Army average for opportunity to command is reasonable, but differences between combat arms are of concern: Infantry is 50 percent, Armor is 25 percent and FA is 8 percent. Differences in opportunity to command a tactical brigade by these margins will be perceived as an unfairness that portends major retention challenges of successful FA battalion commanders.

An "Equal Opportunity" Solution. A solution would be to provide opportunities for FA colonels to compete for selection to command combined arms brigades. Designating commanders of Infantry, Armor and FA brigades as "combined arms brigade commanders" is the first step. This would provide for successful commanders of Infantry, Armor and Field Artillery battalions to compete equally for brigade command—each with a 30 percent opportunity.

With a current Army average of 28 percent, an equal opportunity among Infantry, Armor and FA battalion commanders of 30 percent would rectify a significant imbalance in the opportunity to compete and continue to serve at the senior levels. Appropriate guidance to the FY06 Selection Boards could correct this problem. *Editor's Note: Subsequent to this article's writing, the US Army Chief of Staff announced a policy change that allows FA colonels (and selects) to compete for BCT commands.*

Down Number Two—Failure to Emphasize the Urgent Need to Lighten the Force. The second Down is an urgent need for modernizing fires for light forces



Members of C Battery, 1-321 FA, 18th Fires Brigade (Airborne), fire the M777 howitzer at Forward Operating Base Bostick, Afghanistan, 17 March. (Photo by SGT Matthew Moeller)

and an overall need to lighten the entire force. The Army is moving out smartly to modularize fighting forces and is making progress. There is also investment to develop a Future Combat System.

But what is missing in both of these initiatives is emphasis to reduce the logistics tail, lighten the entire force and reduce the cost of ownership. What fraction of the US Army's total budget goes to logisticians and their processes? What fraction of strategic lift goes for tail, what fraction for tooth? A historic number of trigger-pullers to supporters has been one to seven; what is it today? What should it be? These are relevant questions.

Cost of ownership is growing because of the cost of manpower. In time, the manpower intensive tail will begin consuming the tooth if this growth is not stopped. Why continue to support massive logistics tails without understanding their true costs and implications? This is an Army problem, not just an Artillery matter. We must insist on working the complete picture to lighten the force and reduce the cost of ownership.

Fires for Light Forces. For the Artillery, there is a critical need to lighten the Fires component for light forces. Serious thought needs to be given to affordable precision mortars (affordable is defined as \$1,500 per round in lots of 100,000; not \$100,000 per round in lots of 1,500). The 120-mm mortars are inherently flexible, very effective, easily transported and the least costly in terms of resupply effort. Precise munitions lighten the logistics tail and enhance agility of the force.

Additionally, it is time for a new, modern howitzer for light forces. These troops have the greatest likelihood of being deployed early. Why not put our highest priorities on properly equipping them with affordable, precise mortars and munitions and the urgent development of a modern light howitzer?

Reduce the Ammo Logistics Tail. The large, complex logistics tail of the Army is a critical concern and adversely impacts Artillery. Long-range, precise rockets and missiles help because of their long range, precision, ability to shift rapidly and inherent 24/7 availability—more affordable solutions would increase their benefit. These weapons significantly lighten logistic burdens.

Further, their cost of ownership, strategic lift and manpower costs of long-range precision fires are minimal compared to alternatives. Compare total life-cycle costs of owning a HIMARS

unit with owning a slice of an Air Wing with equal effectiveness—there is an enormous saving for the nation.

Reduced Cost of Ownership. Major initiatives to reduce the costs associated with owning the Army's equipment are sorely needed. This matter is bigger than just the Artillery. Any development or procurement should have the cost of ownership spelled out before a decision is made to accept the system. Today, we do not have the means to see and control these costs of ownership.

Most modern successful businesses set their costs for general and administrative expenses at something less than 12 to 15 percent. By my approximations, the Army's general and administrative costs are more than 60 percent. A no-nonsense look is sorely needed at the Army's true operating costs, both peace and war times, and a modern plan for controlling them.

To compare the cost of the Army's logistics operations with a modern company of comparable scope, I have compared my estimate of the cost of Army's spare parts operations with that of Caterpillar Logistics, which supports a fleet of equipment of comparable size to the Army. The costs of Caterpillar Logistics suggest they are accomplishing a mission of similar scope at less than one-tenth the cost of the Army's and with responsiveness standards far superior to the Army's.

Moreover, the Army's costs will continue to grow because of manpower content and the extensive costs to recover from recent combat operations. This growing operations and support cost of the Army will continue to demand payment at the

expense of investment accounts for future capabilities. Estimates that I have calculated would suggest that if things continue unchecked, the investment accounts will disappear by 2019 because of the burgeoning operations and support costs.

Down Number Three—Ossified Development and Acquisition Apparatuses. The third problem is focused on the means for development and acquisition of future capabilities. This, too, is an Army-wide problem, not just an Artillery matter. During the Cold War, extensive effort was placed to achieve the greatest performance. The supporting scenarios, analyses and algorithms represented attrition warfare between large formations. For that problem, these tools served us well. But today, they are not relevant, and their use can lead to improper conclusions.

Similarly, the concept-based requirements system required projections of threat and technology well beyond the next decade. And the material development, testing and acquisition processes supporting the requirements system become extensive, expensive and burdensome. These massive apparatuses for development and acquisition, which took decades to develop, are not relevant today—they must be abandoned as soon as possible.

The ideas underlying transformation are forward looking, but the apparatuses for development and acquiring the capabilities are backward thinking. We can no longer afford to wait 17 years from concept formulation to fielding.



Soldiers from A/2-320 FA, 1st Brigade Combat Team (BCT), 101st Airborne Division, fire rounds from their M119A2 howitzer at enemy targets in Iraq, 13 January 2008. The Army reformation put Artillery units in BCTs, giving maneuver commanders direct command and control of Artillery rocket and missile fires. (Photo by 1LT Jonathan J. Springer)



A M109A6 Paladin self-propelled 155-mm howitzer fires a round on Forward Operating Base Warrior, Kirkuk, Iraq, 13 February. This is the first time this particular Paladin has been fired in Iraq, and it is being calibrated to ensure it can hit its target every time. (Photo by PVT Justin Naylor, 2nd Brigade Combat Team, 1st Cavalry Division Public Affairs)

Much of tomorrow's technology will be obsolesced within that 17-year period. Gaining the future combat capabilities is not limited by technology or funding, but by our wrong-headed processes and decision making schemes.

The path ahead. My proposition is simple but difficult—completely discard the current development and acquisition systems. The first step is to establish a small board empowered to perform triage on the current programs and salvage those few that are relevant and can be fielded within three to five years. Terminate the remainder, accept the loss and reset the entire process of developing capabilities and acquiring materiel. It is time to reboot the entire process.

Back to Basics. Go back and reexamine the excellent roots from where the processes originated. They started from sound propositions and were initially fairly responsive. The Army needs to reset the fundamental operations analyses with relevant scenarios, redefine the analytic and war-gaming algorithms and establish legitimate battle labs properly resourced and instrumented with modern capabilities.

Because the fundamental elements of battle are fire and maneuver, we need two primary, properly resourced battle labs—one for Maneuver and one for Fires. The two could operate in a virtual battlespace to examine integrated combined arms issues. A third overarching laboratory for integrating command, control, communications and intelligence (C³I) should then be established as part of the Combined Arms Center, Fort Leavenworth, Kansas.

Using modern technologies and distance-learning techniques, these battle labs could run virtual and live experiments and, in a timely manner, generate

the necessary intellectual, analytic and technical underpinning for capabilities-based developments. Further, in this new model, the senior Army leadership should make the Chiefs of Fires and Maneuver the service acquisition authorities. Modern, competent battle labs with decentralized acquisition authorities could bring modern capabilities to the field before the technology is obsolete.

Leverage Modern Tools and Procedures. Many of the old tools and processes should be scrapped. New simulation, development and testing processes with embedded Six-Sigma concepts can reduce testing significantly and provide remarkable improvements in production time and costs as well as reduction of operating and ownership costs. The performances being seen in all walks of industry today bear witness to these facts.

There are a few, piece-wise pockets of excellence within Army Material Command, but a holistic Army-wide initiative is needed. One can only hope that the senior stewards of the Army no longer will tolerate incompetent processes and organizations, while being fully aware of the remarkable capabilities within industry around the globe. If they can demonstrate the fortitude, we then will see some hard-nosed programmatic triage followed by bold, courageous reformation of the ossified processes—while on their watch. It is incomprehensible that in this third millennium we should take 15 to 17 years before fielding modern capabilities.

The Artillery is at a crossroads and faces choices of historic consequence. An opportunity of this magnitude comes along ever so seldom. The good news is that those responsible have selected the correct path(s), are making good headway and getting some things right.

The collocating of the two Branches again is the right thing to do. The joint common grid is the largest combat multiplier of this era, and the progress in integrating Fires and Maneuver will enhance combat operations. Hopefully, wisdom and common sense will prevail, and the leader development glitch soon will be resolved fairly.

But the bad news is that if there is not a major Army-wide initiative in the near term to reduce the growing cost of ownership and massive logistic tails, none of this good work will matter. The Army's tooth-to-tail ratio will dwindle to a small fraction as the tail continues to grow unchecked. If our senior stewards can muster the fortitude to leverage what is already available, demonstrate wisdom in programmatic triage and empower bold reformation of ossified processes, then our Soldiers will have only the finest combat capabilities our country is paying for.

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